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DRAFT REPORT
ROUND 10 DAM ASSESSMENT
ALLIANT ENERGY – NELSON DEWEY GENERATING STATION
SLAG POND, WPDES POND
CASSVILLE, WISCONSIN
NOVEMBER 15, 2011

PREPARED FOR:

U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

PREPARED BY:

GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, Ma 02062
GZA File No. 01.0170142.30

DRAFT

GZA
GeoEnvironmental, Inc.

Engineers and
Scientists

November 15, 2011
GZA File No. 170142.30

Mr. Stephen Hoffman
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

RE: DRAFT Assessment of Dam Safety of Coal Combustion Surface Impoundments at the Nelson Dewey Generating Station

Dear Mr. Hoffman,

One Edgewater Drive
Norwood,
Massachusetts 02062
Phone: 781-278-3700
Fax: 781-278-5701
http://www.gza.com

In accordance with our proposal 01.P0000177.11 dated March 28, 2011, and U.S. Environmental Protection Agency (EPA) Contract No. EP10W001313, Order No. EP-B115-00049, GZA GeoEnvironmental, Inc. (GZA) has completed our inspection of the Nelson Dewey Generating Station Coal Combustion Waste (CCW) Impoundments located in Cassville, Wisconsin. The site visit was conducted on June 7, 2011. The purpose of our efforts was to provide the EPA with a site specific inspection of the impoundments to assist EPA in assessing the structural stability of the impoundments under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104(e). We are submitting one hard copy and one CD-ROM copy of this Draft Report directly to the EPA.

Based on our visual inspection, and in accordance with the EPA's criteria, the Slag Pond and WPDES Pond are currently in **FAIR** condition in our opinion. Further discussion of our evaluation and recommended actions are presented in the Task 3 Dam Assessment Report. The report includes: (a) a completed Coal Combustion Dam Inspection Checklist Form for each Basin; (b) a field sketch; and (c) selected photographs with captions. Our services and report are subject to the Limitations found in **Appendix A** and the Terms and Conditions of our contract agreement.

We are happy to have been able to assist you with this inspection and appreciate the opportunity to continue to provide you with dam engineering consulting services. Please contact the undersigned if you have any questions or comments regarding the content of this Task 3 Dam Assessment Report.

Sincerely,

GZA GeoEnvironmental, Inc.

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PREFACE

The assessment of the general condition of the dams/impoundment structures reported herein was based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations were beyond the scope of this report.

In reviewing this report, it should be realized that the reported condition of the dams and/or impoundment structures was based on observations of field conditions at the time of inspection, along with data available to the inspection team. In cases where an impoundment is lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions, which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is critical to note that the condition of the dam and/or impoundment structures depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the reported condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Prepared by:

GZA GeoEnvironmental, Inc.

Patrick Harrison, P.E.

License No.: 14164-6
Senior Geotechnical Consultant
GZA GeoEnvironmental, Inc.

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EXECUTIVE SUMMARY

This Inspection Report presents the results of a visual inspection of the Alliant Energy (Alliant) - Nelson Dewey Generating Station (NDGS) Coal Combustion Waste (CCW) Impoundments located at 11999 County Road VV, Cassville, Wisconsin. These inspections were performed on June 7, 2011 by representatives of GZA GeoEnvironmental, Inc (GZA), accompanied by representatives of Alliant.

The NDGS power plant has two coal-fired units with a maximum generating capacity of approximately 200 Megawatts. Commercial operation of the facility began in the late 1950s and a CCW Impoundment that included what is now the Slag Pond was commissioned at that time. The Slag Pond was modified in 1976 and 1996. Subsequently, the WPDES Pond was commissioned in 1976 and modified in 1999. The impoundments were constructed for the purpose of storing and disposing non-recyclable CCW from the NDGS facility and clarification of water prior to discharge.

The Slag Pond primarily receives fly/economizer ash and slag. However the impoundment also receives slag transport water, boiler water wash, air heater wash (fly ash), steam grade water production wastewaters, storm water runoff from the plant grounds, coal pile runoff, plant floor drains, and boiler blowdown (steam/water). The WPDES Pond receives fly/economizer ash, slag from washing of boilers, boiler water wash, air heater wash (fly ash), storm water runoff from Site, and coal pile runoff. During our inspection, GZA observed the general condition of the Old Fly Ash Pond, which is licensed as a closed landfill, and subsequently completed the EPA checklist. However, based on discussions with the EPA, analysis of the Old Fly Ash Pond was judged not to fall within our scope of work as the unit no longer can impound water and does not meet the criteria set forth by the U.S. EPA for further evaluation.

For the purposes of this EPA-mandated inspection, the size of the impoundments was based on U. S. Army Corps of Engineers (COE) criteria. Based on the maximum embankment height of 10 feet and a storage volume of approximately 20 acre-feet, The Slag Pond is classified as a **Small**-sized structure. Based on the maximum embankment height of 10 feet and a storage volume of approximately 26 acre-feet, the WPDES Pond is classified as a **Small**-sized structure. According to guidelines established by the COE, dams with a storage volume less than 1,000 acre-feet and/or a height less than 40 feet are classified as Small-sized structures.

Under the EPA classification system, as presented on page 2 of the EPA check list (**Appendix C**) and Definitions section (**Appendix B**), it is GZA's opinion that the Slag Pond and the WPDES Pond would be considered as having a **Low** hazard potential. The hazard potential rating is based on no probable loss of human life due to failure and the low potential for environmental impacts outside of Utility-owned property.

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Assessments

In general, the overall condition of the Slag Pond was judged to be **FAIR** and was found to have the following deficiencies:

1. Animal burrows along the crest;
2. Shrubs growing on the upstream slope;
3. Incomplete stability analysis;
4. Minor erosion on the downstream slope; and,
5. Wave action erosion of the upstream slope.

In general, the overall condition of the WPDES Pond was judged to be **FAIR** and was found to have the following deficiencies:

1. Infrequent mowing of the embankments allowing shrub growth; and,
2. Incomplete stability analysis.

The following sections describe the recommended approach to address current deficiencies. Prior to undertaking recommended maintenance, repairs, or remedial measures, the applicability of permits needs to be determined for activities that may occur within the jurisdiction of the appropriate regulatory agencies.

GZA recommends the following studies and analyses:

1. Expand the stability analysis of the impoundment embankments to include water surface and seepage conditions that represent the 100 year, 24-hour storm event. The analysis should include justification of the soil parameters used through in-situ or laboratory testing and also account for the presence of the clay at the base of the embankment.

Recurrent Operation & Maintenance Recommendations

GZA recommends the following operation and maintenance level activities:

1. Repair sloughing on the downstream slope of the Slag Pond;
2. Protect the northwestern embankment of the Slag Pond from wave action erosion; and,
3. Control burrowing animals on and near embankment
4. Fill animal burrows.

SLAG POND AND WPDES POND
ALLIANT ENERGY, NELSON DEWEY GENERATING STATION
CASSVILLE, WISCONSIN

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1.0 DESCRIPTION OF PROJECT

1.1 General

1.1.1 Authority

The United States Environmental Protection Agency (EPA) has retained GZA GeoEnvironmental, Inc. (GZA) to perform a visual inspection and develop a report of conditions for the Alliant Energy (Alliant, Owner) Nelson Dewey Generating Station (NDGS, Site) Coal Combustion Waste (CCW) Impoundments in Grant County, Wisconsin. This inspection was authorized by the EPA under the authority of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Section 104(e). This inspection and report were performed in accordance with Request for Quote (RFQ) RFQ-DC-16, dated March 16, 201 1, and EPA Contract No. EP10W001313, Order No. EP-B11S-00049. The inspection generally conformed to the requirements of the Federal Guidelines for Dam Safety[1] and this report is subject to the limitations provided in **Appendix A** and the Terms and Conditions of our Contract Agreement.

1.1.2 Purpose of Work

The purpose of this investigation was to visually inspect and evaluate the condition of the impoundments and appurtenant structures (the management unit) to attempt to identify conditions that may adversely affect their structural stability and functionality, to note the extent of any deterioration that may be observed, review the status of maintenance and needed repairs and to evaluate the conformity with current design and construction standards of care.

The investigation was divided into five parts: 1) obtain and review available reports, investigations and data from the Owner pertaining to the impoundment and appurtenant structures; 2) perform a review with the Owner of available design, inspection and maintenance data and procedures for the management unit; 3) perform a visual inspection of the Site; 4) prepare and submit a field assessment checklist; and 5) prepare and submit a draft report presenting the evaluation of the structure, including recommendations and proposed remedial actions.

1.1.3 Definitions

To provide the reader with a better understanding of the report, definitions of commonly used terms associated with dams are provided in **Appendix B**. Many of these terms may be included in this report. The terms are presented under common categories associated with dams, which include: 1) orientation; 2) dam components; 3) size classification; 4) hazard classification; 5) general; and 6) condition rating.

1.2 Description of Project

1.2.1 Location

The NDGS is located approximately one mile northwest of the City of Cassville in Grant County, Wisconsin. The entrance to the Site is on County Highway VV and the CCW

[1] FEMA/ICODS, April 2004: http://www.ferc.gov/industries/hydropower/safety/guidelines/fema-93.pdf.

impoundments are located about ¼-mile north and northwest of the power plant at approximately latitude 42 43' 32" North and longitude 91 00' 39" West. A Site locus of the impoundments and surrounding area is shown on **Figure 1**. An aerial photograph of the impoundments and surrounding area is provided as **Figure 2**. T he impoundments can be accessed by vehicles from earthen access roads from the power plant.

1.2.2 Owner/Caretaker

The CCW impoundments are owned by Alliant and are operated by the NDGS.

	Dam Owner/Caretaker
Name	Alliant Energy, Nelson Dewey Generating Station
Mailing Address	11999 County Road VV
City, State, Zip	Cassville, Wisconsin 53806
Contact	Maria V. Lauck
Title	Plant Manager
E-Mail	MariaLauck@alliantenergy.com
Daytime Phone	608-725-2232
Emergency Phone	911

1.2.3 Purpose of the Impoundments

The NDGS power plant has two coal-fired units with a maximum generating capacity of approximately 200 Megawatts. Commercial operation of the facility began in the late 1950s and a CCW Impoundment that included what is now the Slag Pond was commissioned at that time. The Slag Pond was modified in 1976 and 1996. Subsequently, the WPDES Pond was commissioned in 1976 a nd modified in 1999. The impoundments were constructed for the purpose of storing and disposing non-recyclable CCW from the NDGS facility and clarification of water prior to discharge.

The Slag Pond primarily receives fly/economizer ash and slag. H owever the impoundment also receives slag transport water, boiler water wash, air heater wash (fly ash), steam grade water production wastewaters, storm water runoff from the plant grounds, coal pile runoff, plant floor drains, and boiler blowdown (steam/water). The WPDES Pond receives fly/economizer ash, slag from washing of boilers, boiler water wash, air heater wash (fly ash), storm water runoff from Site, and coal pile runoff.

During our inspection, GZA observed the general condition of the Old Fly Ash Pond, which is licensed as a closed landfill, and subsequently completed the EPA checklist. However, after further discussion with the EPA, analysis of this structure does not fall within our scope of work as the unit does not meet the criteria set forth by the U.S. EPA for a coal ash impoundment as it no longer does or can impound water. A few photos of the Old Fly Ash Pond are provided in **Appendix F** for reference, but the structure is not further analyzed in this report.

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1.2.4 Description of the Slag Pond and Appurtenances

The Slag Pond is contained within an area that previously was a larger impoundment designed by Sargent & Lundy and modified by Warzyn Engineering and Service Company, Inc. (Warzyn). The following description of the impoundment is based on information provided in the Warzyn design drawings, a hydraulic/hydrologic and stability analysis conducted by Aether dbs (Aether Analysis), information received from Alliant and observations made by GZA during our Site visit.

The Slag Pond is located northwest of the NDGS and serves as a settling pond for CCW generated by the NDGS. The original impoundment that included the Slag Pond was commissioned in 1959 and appears to have been designed by Sargent & Lundy when the power plant was designed.[2] An area of the 1959 impoundment that includes the Slag Pond was redesigned in 1976 by Warzyn to include the addition of several embankments as shown on **Figure 3**. The impoundment was further modified in 1996 and has been in the current configuration since that time.

Water and CCW discharge into the Slag Pond through a series of discharge pipes which are located along the southwestern and southeastern portions of the impoundment as shown on **Figure 4**. There are four (4) 12-inch diameter steel pipes and one (1) 8-inch diameter HDPE pipe that discharge into the Slag Pond. Water and unsettled solids are discharged from the Slag Pond into the Mississippi River through a rectangular weir outlet structure which is near the western corner of pond. Plans and details of the outfall structure are provided as **Figure 5**.

The northern slope of the Slag Pond abuts the closed landfill and is incised relative to the closed landfill. The southern slope of the current Slag Pond is located greater than 100 feet from the perimeter embankment of the 1976 impoundment. The eastern embankment and western embankment of the current Slag Pond appear to be defined by the perimeter embankments of the 1976 impoundment. However, the eastern portion of the Slag Pond is incised relative to the nearby topography. The Slag Pond embankment has a height (from the lowest downstream toe elevation to the crest of the impoundment) of approximately 10 feet and a crest elevation of approximately 625.0 feet. The embankments of the 1976 impoundment were constructed with 2.5-foot horizontal to one-foot vertical (2.5H:1V) upstream slopes and 3H:1V downstream slopes. The embankments were constructed with an ash core and 5 feet of silty sand was placed on the crest and the downstream slope. Since 1976, gravel has been placed on the crest to facilitate an access road along the western, southern, eastern crest of the impoundment. A typical cross section of the 1976 embankments is shown on **Figure 3**.

Instrumentation near the impoundment includes a staff gauge and six monitoring wells (B-7R, B-11, B-11A, B-11B, B-31A, and B-31B) which are located along the southern portions of the impoundment, as shown on **Figure 4**.

1.2.5 Description of the WPDES Pond Impoundment and Appurtenances

The WPDES Pond was designed by Warzyn and modified in 1999. The following description of the impoundment is based on information provided in the Warzyn design

[2] GZA found references mentioning the design of the impoundments by Sargent & Lundy in the 1950's during review of the files maintained by the Wisconsin Department of Natural Resources. However, no specific information was available regarding the design details.

drawings, information received from Alliant and observations made by GZA during our Site visit.

The WPDES Pond is located north of the NDGS. The impoundment was commissioned in 1976, and serves as a settling pond for CCW generated by the NDGS. The interior embankments of the impoundment were reconfigured and the impoundment was resized in 1999. Discharges from the facility enter the impoundment through a CMP culvert near the southeastern corner of the impoundment. The impoundment only receives water and CCW from the facility during boiler maintenance activities; typically 3 to 4 times a year. Stormwater and coal pile runoff enter the WPDES Pond along the southwestern portion of the impoundment. Water in the WPDES Pond is typically recycled and used for dust control on the coal pile. As necessary, water is pumped from the WPDES Pond to the Slag Pond via the pump house which is located near the northwestern portion of the impoundment. The location of the WPDES Pond discharge pipes and pump house are shown on **Figure 6**.

The WPDES Pond is incised into the coal pile storage area to the south and the closed landfill to the west. The eastern and northern portions consist of an earthen embankment with a general height (from the lowest downstream toe elevation to the crest of impoundment) of approximately 10 feet. The impoundment has a crest length of approximately 2,500 feet and a crest elevation of approximately 620.0 feet MSL. Based on the Aether stability analysis, the embankment soils consist of silt or sand that bear on a thin layer of organic clay which is underlain by sand. The embankments were constructed with a 2.5H:1V downstream slope and gravel was placed on the crest to facilitate an access road along the western, northern, and eastern embankments of the impoundment.

Instrumentation near the impoundment includes two staff gauges (SG-10, SG-11) and one monitoring well (B-28) which are located near the southeastern embankment of the impoundment as shown on **Figure 6**.

1.2.6 Operations and Maintenance

The NDGS and the impoundments are maintained by Alliant personnel. Maintenance of the NDGS facility, including the impoundments, is regulated by the EPA under the National Pollutant Discharge Elimination System (NPDES) Permit No. WI-0002381-06-0. NDGS personnel perform visual inspections of the impoundments on a quarterly basis and the inspection results from September 16, 2011 were provided to GZA.

1.2.7 Size Classification

For the purposes of this EPA-mandated inspection, the size of the impoundments was based on U. S. Army Corps of Engineers (COE) criteria. Based on the maximum embankment height of 10 feet and a storage volume of approximately 20 acre-feet, The Slag Pond is classified as a **Small**-sized structure. Based on the maximum embankment height of 10 feet and a storage volume of approximately 26 acre-feet, the WPDES Pond is classified as a **Small**-sized structure. According to guidelines established by the COE, dams with a storage volume less than 1,000 acre-feet and/or a height less than 40 feet are classified as Small-sized structures.

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1.2.8 Hazard Potential Classification

Under the EPA classification system, as presented on page 2 of the EPA check list (**Appendix C**) and Definitions section (**Appendix B**), it is GZA's opinion that the Slag Pond and the WPDES Pond would be considered as having a **Low** hazard potential. The hazard potential rating is based on no probable loss of human life due to failure and the low potential for environmental impacts outside of Utility-owned property.

1.3 Pertinent Engineering Data

1.3.1 Drainage Area

Based on information provided in the Aether Analysis, approximately 21 acres and 30 acres drain into the WPDES Pond and the Slag Pond, respectively.

1.3.2 Reservoir

Based on information provided by Alliant, the Slag Pond and the WPDES Pond have surface areas of 4.35 and 4.65 acres at the normal operating levels, respectively. The pool areas observed on GZA's June 7, 2011 Site visit were generally consistent with those reported by Alliant. The storage volumes of the Slag Pond and the WPDES Pond are approximately 20, and 26 acre-feet, respectively.

1.3.3 Discharges at the Impoundment Sites

As discussed previously, the WPDES Pond does not discharge water during most operating conditions and water is typically recycled for dust control or is removed from the impoundment through infiltration or evaporation. When water levels rise above the operating levels, water is pumped to the Slag Pond via the pump house which is located near the northwestern corner of the impoudment. Slag and CCW are discharged into the Slag Pond from the facility and water is discharged into the Mississippi River. Approximately 2.3 million gallons per day (MGD) of water discharges into the Mississippi River based on the Aether Analysis.

1.3.4 General Elevations

Elevations were taken from design drawings, the Aether Analysis and data provided by Alliant. Unless otherwise noted, elevations were based on the United States Geological Survey (USGS) topographic map MSL vertical datum.

Slag Pond

A. Top of Embankment (Minimum)	± 625.0 feet
B. Upstream Water at Time of Inspection	± 616.6 feet
C. Downstream Water at Time of Inspection	± Not Applicable[3]
D. Maximum Pond Water Elevation	± 617.8 feet[4]

[3] It is GZA's opinion that the distance to the Mississippi River was too great to be considered the downstream water level. No water was present along the downstream slope of the northwestern embankment.

[4] The maximum pond water level for the Slag Pond and WPDES Pond were taken to be the level of the 100 year, 24-hour storm event from the Aether Analysis.

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WPDES Pond

A. Top of Embankment (Minimum)	± 620.0 feet
B. Upstream Water at Time of Inspection	± 618.0 feet
C. Downstream Water at Time of Inspection	± Not Applicable[5]
D. Maximum Pond Water Elevation	± 619.3 feet[6]

1.3.5 Design and Construction Records and History

Drawings for the 1976 impoundment design were available in the Wisconsin Department of Natural Resources' (WDNR) files. No construction quality control documentation was available from Alliant or the WDNR files with regards to the impoundments. Soil borings were conducted as part of the Aether Analysis and the borings provided limited information regarding the properties of the soils comprising the embankments. The borings do indicate that the embankments are generally supported on sand. A list of the documents provided to GZA by Alliant is provided in **Appendix D**.

1.3.6 Operating Records

No operating records were available for the impoundments.

1.3.7 Previous Inspection Reports

The impoundments are visually inspected by Alliant personnel on a quarterly basis in accordance with company policies. The inspection report from September 16, 2011 was reviewed by GZA and is included as **Appendix E**. It was noted during the September 16, 2011 inspection that trees and shrubs were present along on the upstream slopes of the Slag Pond. It was recommended that the trees and shrubs be removed and a work order was issued.

2.0 INSPECTION

2.1 Visual Inspection

The NDGS impoundments were inspected on June 7, 2011, by Patrick J. Harrison, P.E., and Douglas P. Simon, P.E., of GZA, and accompanied by Alliant personnel. The weather was sunny with temperatures in the 70°s to 80°s Fahrenheit. Photographs to document the current conditions of the impoundments were taken during the inspection and are provided in **Appendix F**. The water levels in the impoundments at the time of the inspection were as provided in Section 1.3.4. Underwater areas were not inspected, as this level of investigation was beyond GZA's scope of services. Copies of the EPA Checklists are provided in **Appendix C**.

With respect to our visual inspection, there was no evidence of prior releases, failures, or repairs observed by GZA.

[5] No water was present near the downstream slope of the WPDES Pond.
[6] The Aether Analysis assumed no pumping from the WPDES Pond to the Slag Pond when calculating the water level during the 100 year, 24 hour storm event.

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2.1.1 Slag Pond General Findings

In general, the Slag Pond was found to be in **FAIR** condition. An overall Site plan showing the impoundments is provided as **Figure 2**. The location and orientation of the Slag Pond photographs provided in **Appendix F** is shown on **Figure 4**.

2.1.2 Slag Pond Upstream Slope (Photos 1 through 8)

The water surface elevation at the time of our inspection was approximately at elevation 616.6 feet MSL. Therefore, the lower portion of the upstream slope was below the water level and not visible. The upstream slope was generally vegetated with grass that had not been recently mowed along the northern, western, and western portion of the southern slopes. Tall shrubs were also observed on the southern slope. The eastern portion of the southern slope and the eastern slope are near areas of active slag recycling and thus the slopes are defined by various states of slag recycling. Wave action erosion was observed on the western and southern embankments. No signs of movement, displacement, depressions or sloughing were observed at the time of our inspection.

2.1.3 Slag Pond Crest of Impoundment (Photos 6 through 14)

The crest of the Slag Pond had a gravel access road along the western, southern, and eastern embankments and was seeded along the remaining portions. The crest of the impoundment had occasional animal burrows present at the time of out inspection. The alignment of the crest of the impoundment appeared generally level with no large depressions or irregularities observed. Based on information provided by Alliant, the crest of the impoundment is at approximately elevation 625.0 feet MSL. No settlement was observed at the time of our inspection. There was approximately 8 feet of free board at the time of our inspection.

2.1.4 Slag Pond Downstream Slope (Photos 22 and 25)

The Slag Pond abuts the closed landfill and the coal storage area to the north and east, respectively. The southern embankment is located at least 100 feet from the nearest portion of 1976 impoundment perimeter embankment and is considered incised for the purposes of our analysis. Therefore, the discussion of the downstream slope is limited to the western embankment. The downstream slope of the impoundment was generally vegetated with grass that had not been mowed recently. An erosional feature was present near the southwest corner of the downstream slope. No seepage or depressions were observed on the downstream slope or within 15 feet of the toe.

2.1.5 Slag Pond Discharge Pipes (Photos 15 through 21, 23, and 24)

Water and CCW from the plant are discharged into the Slag Pond through a series of 12-inch diameter steel pipes which are located along the southern and eastern embankments of the impoundment. Water is discharged into the Slag Pond from the WPDES Pond through an 8-inch diameter HDPE pipe which is located near the northeast corner of the impoundment. The discharge pipes appeared to be in good condition. GZA observed the condition of the decant structure that transmits water from the Slag Pond to the Mississippi River. The decant structure appeared to be in good condition.

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2.1.6 WPDES Pond General Findings

In general, the WPDES Pond was found to be in **FAIR** condition. An overall Site plan showing the impoundments is provided as **Figure 2**. The location and orientation of photographs provided in **Appendix F** are shown on the Photo Plan in **Figure 6**.

2.1.7 WPDES Pond Upstream Slope (Photos 24 through 35)

The water surface elevation at the time of inspection was approximately at elevation 618.0 feet MSL. Therefore, the lower portion of the upstream slope was below the water level and not visible. The upstream slopes of the northeastern, southeastern, and northwestern slopes were generally vegetated and in good condition. However, the grass had not recently been mowed and shrubs were growing in some areas on the bank. The southern slope abuts the coal pile storage area and limited vegetation and minor erosion was observed along much of the slope. No signs of movement, displacement, depressions or sloughing were observed at the time of our inspection.

2.1.8 WPDES Pond Crest of Impoundment (Photos 24 through 40)

The crest along the northeastern, southeastern, and northwestern portions of the WPDES Pond is generally covered by a gravel access road and was in good condition at the time of our inspection. The crest of the southwestern embankment generally consisted of coal from the adjacent coal pile. The alignment of the crest of the impoundment appeared generally level with no large depressions or irregularities observed. Based on information provided by Alliant, the crest elevation was approximately elevation 620.0 feet MSL. No structural settlement was observed at the time of our inspection. There was approximately 2 feet of freeboard at the time of our inspection.

2.1.9 WPDES Pond Downstream Slope (Photos 39 and 40)

The WPDES Pond is incised into the closed landfill to the northwest and the coal pile storage area to the southwest. Therefore, the discussion of downstream slopes for the WPDES Pond refers to the southeastern and northeastern embankments. The downstream slopes of the impoundment were generally vegetated with grass that had not been recently mowed along the northeastern embankment. No seepage, depressions, or sloughing was observed on the downstream slope.

2.1.10 WPDES Pond Discharge Pipes (Photos 41 through 44)

Stormwater runoff enters the WPDES Pond along the southwestern embankment. Water and CCW enters the WPDES Pond through a 12-inch diameter CMP pipe which is located near the southeastern corner of the impoundment. The discharge pipe appeared to be in satisfactory condition at the time of our visual inspection.

Water in the WPDES Pond is generally allowed to infiltrate or evaporate. In addition, water from the WPDES Pond is used for dust control. When necessary, water is pumped from the WPDES Pond to the Slag Pond via the pump house near the northern corner of the impoundment. The visible portions of the pump house appeared to be in good condition.

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2.2 Caretaker Interview

Maintenance of the impoundments is the responsibility of NDGS personnel. GZA met with NDGS personnel and discussed the operations and maintenance procedures, regulatory requirements and the history of the impoundments since their construction. The observations, descriptions and findings presented in this report reference these discussions.

2.3 Operation and Maintenance Procedures

As discussed in Section 1.2.5, NDGS personnel are responsible for maintenance of the impoundments. No formal maintenance program is in place for the impoundments but trees and shrubs are sprayed as necessary. Based on our discussions with NDGS personnel, the impoundments are monitored quarterly in accordance with company procedures.

2.4 Emergency Action Plan

The NDGS has a general Emergency Action Plan (EAP) for the facility, however it is not specific to potential situations that may arise at the impoundments. Note that the hazard potential classification for the impoundments is discussed in Section 1.2.8.

2.5 Hydrologic/Hydraulic Data

The June 27, 2011 Aether Analysis included a hydrologic/hydraulic analysis of the Slag Pond and the WPDES Pond. Based on the Aether Analysis, the 100 year, 24-hour rain event, which is 6.3 inches of rain, would raise the WPDES Pond water level to an elevation of 619.3 feet MSL. The resulting freeboard in the WPDES Pond is approximately 8 inches. The analysis for the WPDES Pond assumed there was no infiltration or removal of water via the pump house.

The Aether Analysis indicated that the 100 year, 24 hour rain event would raise the Slag Pond water level to an elevation of 617.8 feet MSL. The resulting freeboard would be greater than two feet which in GZA's opinion would be adequate.

2.6 Structural and Seepage Stability

The stability of the impoundments was evaluated as part of the Aether Analysis. Based on the Aether Analysis, the calculated static factor of safety of the embankments during normal operating conditions for the WPDES Pond and the Slag Pond was 1.6 and 2.5, respectively. The calculated factor of safety under earthquake loading was 1.5 and 2.2 for the WPDES Pond and the Slag Pond, respectively. The reported factors of safety are met generally acceptable criteria for dams. It was Aether's opinion that rapid drawdown conditions would only apply to the Slag Pond and the calculated factor of safety under that loading condition was 2.1.

The Aether Analysis report indicates that the purpose of the analysis was to evaluate the stability of the impoundments under the 100 year storm flows, which would represent typical design criteria. However, the stability analysis for the Slag Pond and the WPDES Pond was conducted with water levels at the normal operating levels.

Based on the information appended to the Aether Analysis, it appears that Aether estimated the internal angle of friction for the embankment materials from the relative density of the soils. However, no in-situ or laboratory testing information was presented or discussed to support the relative densities or subsequently the internal friction angles used in the analysis. Furthermore, it was not apparent as to which soil parameter would used to model the layer of clay that was encountered at the base of the WPDES Pond embankments.

GZA did not perform an independent analysis of the seepage or stability of the impoundments.

3.0 ASSESSMENTS AND RECOMMENDATIONS

3.1 Assessments

In general, the overall condition of the Slag Pond was judged to be **FAIR** and was found to have the following deficiencies:

1. Animal burrows along the crest;
2. Shrubs growing on the upstream slope;
3. Incomplete stability analysis;
4. Minor erosion on the downstream slope; and,
5. Wave action erosion of the upstream slope.

In general, the overall condition of the WPDES Pond was judged to be **FAIR** and was found to have the following deficiencies:

1. Infrequent mowing of the embankments allowing shrub growth; and,
2. Incomplete stability analysis.

The following sections describe the recommended approach to address current deficiencies. Prior to undertaking recommended maintenance, repairs, or remedial measures, the applicability of permits needs to be determined for activities that may occur within the jurisdiction of the appropriate regulatory agencies.

3.2 Studies and Analyses

GZA recommends the following studies and analyses:

1. Expand the stability analysis of the impoundment embankments to include water surface and seepage conditions that represent the 100 year, 24-hour storm event. The analysis should include justification of the soil parameters used through in-situ or laboratory testing and also account for the presence of the clay at the base of the embankment.

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3.3 Recurrent Operation & Maintenance Recommendations

GZA recommends the following operation and maintenance level activities:

1. Repair sloughing on the downstream slope of the Slag Pond;
2. Protect the northwestern embankment of the Slag Pond from wave action erosion; and,
3. Control burrowing animals on and near embankment
4. Fill animal burrows.

3.4 Alternatives

There are no alternatives currently recommended.

4.0 ENGINEER'S CERTIFICATION

I acknowledge that the management units referenced herein, the Slag Pond and WPDES Pond have been assessed to be in **FAIR** condition on June 7, 2011.

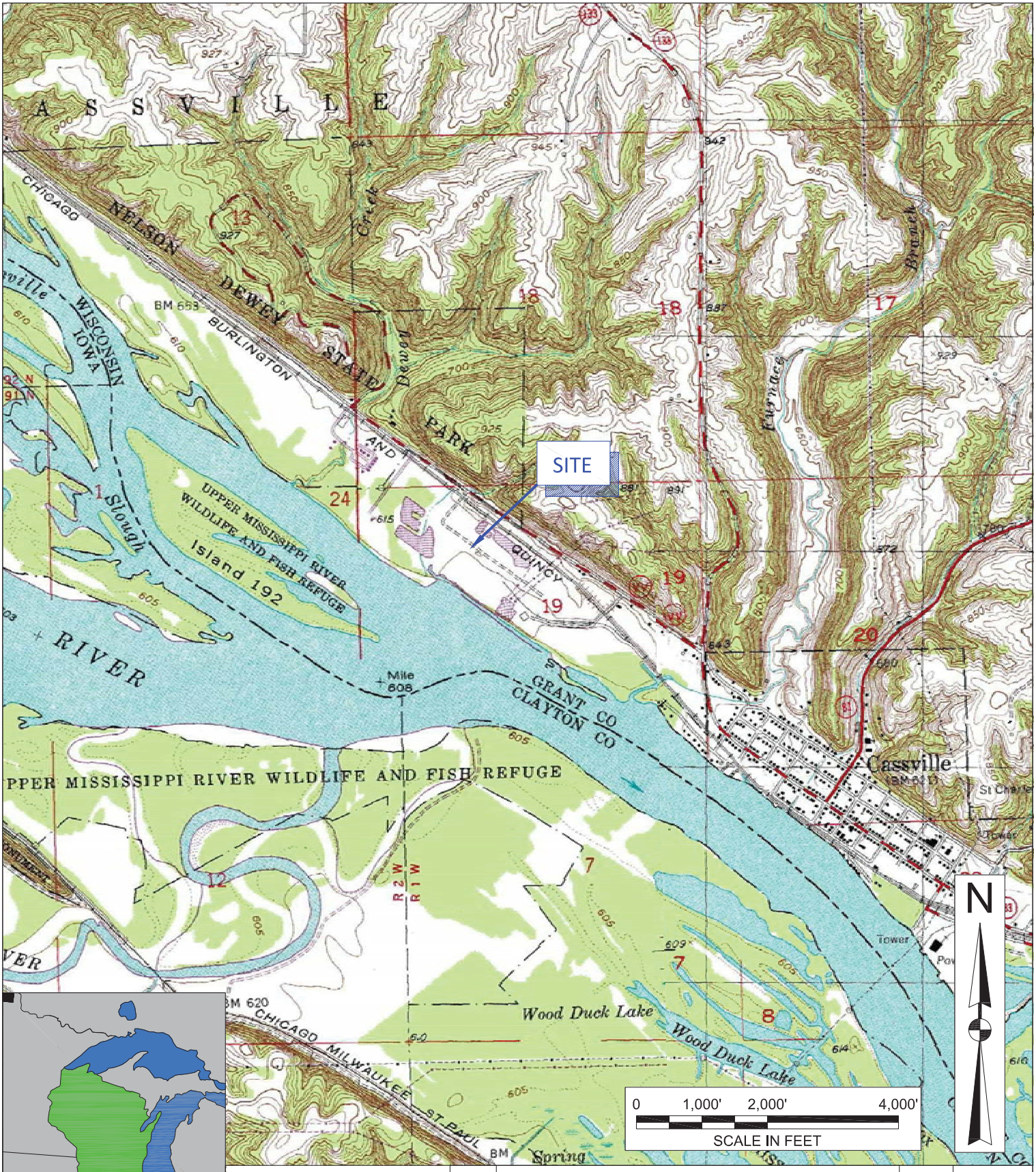
Patrick J. Harrison, P.E.
Senior Consultant

J:\170,000-179,999\170142\170142-30 Round 10\Nelson Dewey - Alliant\DRAFT - Nelson Dewey Report.docx

US EPA ARCHIVE DOCUMENT

US EPA ARCHIVE DOCUMENT

FIGURES



SOURCE: U.S.G.S. QUADRANGLE MAPS
CASSVILLE, WI (1955) PHOTOINSPECTED (1978)
TURKEY RIVER, IA-WI (1957) PHOTOREVISED (1980)

NO.	ISSUE/DESCRIPTION	BY	DATE

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PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
20900 SWENSON DRIVE, SUITE 150
WAUKESHA, WISCONSIN 53186
(262) 754-2560

PREPARED FOR:

SITE LOCATION MAP

CASSVILLE, WISCONSIN

FIGURE 1

SHEET NO.

PROJ MGR:	DS	REVIEWED BY:	DS	CHECKED BY:	DS	DATE	PROJECT NO.	REVISION NO.
DESIGNED BY:	DS	DRAWN BY:	CLK	SCALE:	1 : 24000	7/7/11	01.0170142.30	

©2011 – GZA GeoEnvironmental, Inc. GZA-J:\GZA_USA#\01.0170142.30 Ash Imp. Round 10\01.0170142.30 Task 4 - Nelson Dewey\Drawings\Autocad\SITE LOCATION.dwg [FIGURE 1 - SITE LOCATION] July 07, 2011 - 3:44pm justin.hegarty

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GZA—J:\GZA_USA#\01.0170142.30 Ash Imp. Round 10\01.0170142.30 Task 4 – Nelson Dewey\Drawings\Autocad\SITE PLANS.dwg [FIG 2] November 13, 2011 – 11:48am doug.simon

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N
W E
S

250 125 0 250 Feet

LEGEND

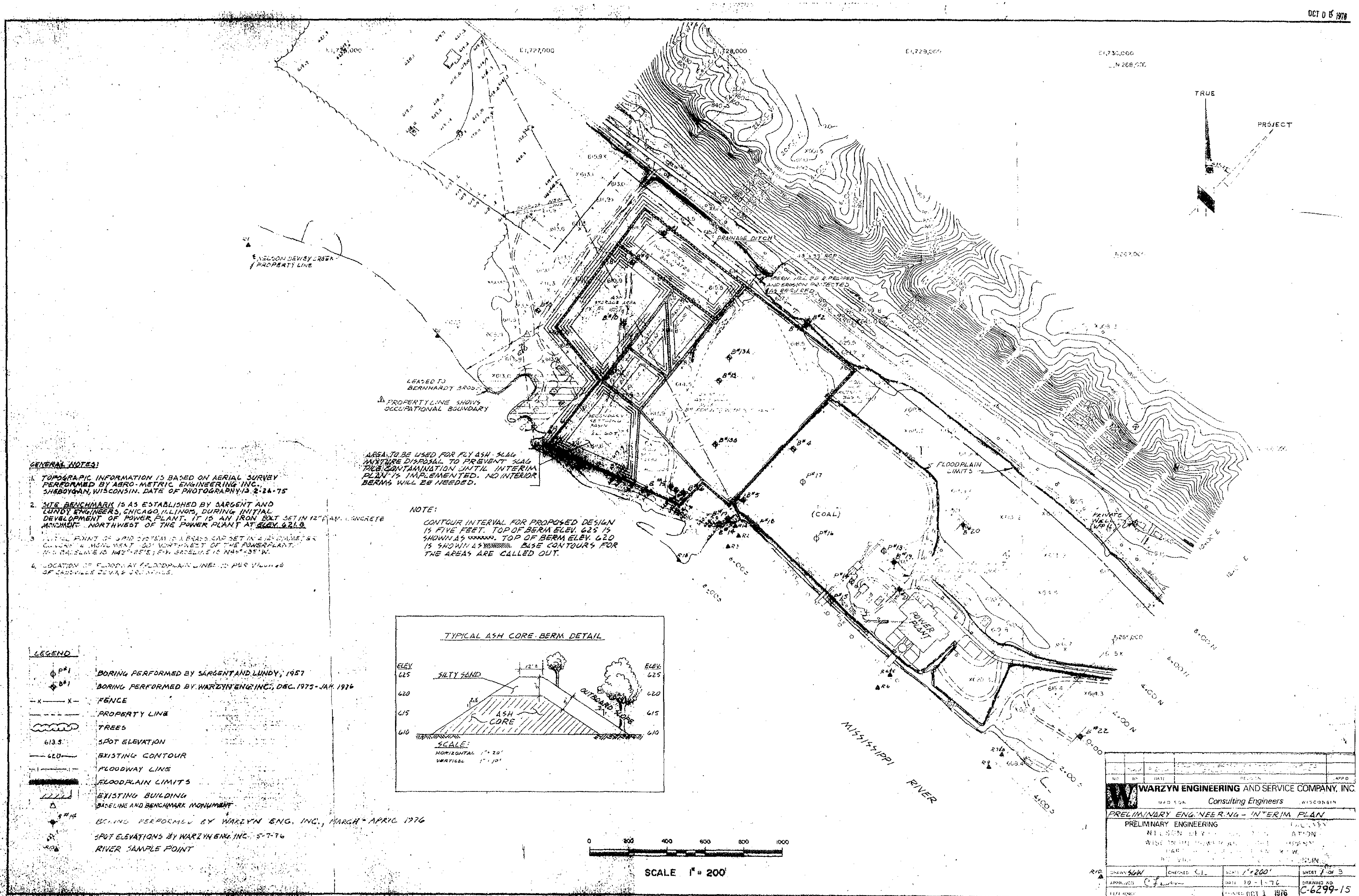
APPROXIMATE IMPOUNDMENT BOUNDARY

GZA GeoEnvironmental, Inc.
20900 Swenson Drive, Suite 150
Waukesha, Wisconsin 53186
Phone: (262) 754-2560 Fax: (262) 754-9711

NELSON DEWEY GENERATING STATION
11999 COUNTY ROAD VV
CASSVILLE, WISCONSIN

OVERALL ASH BASIN PLAN

PROJ. MGR.: DPS DESIGNED BY: DPS REVIEWED BY: DPS OPERATOR: CLK	DWG. Date: 11-01-11 Job NO.: 01.0170143.30	FIGURE NO.: 2



NELSON DEWEY GENERATING STATION
11999 COUNTY ROAD VV
CASSVILLE, WISCONSIN

1976 IMPOUNDMENT DESIGN AND CROSS SECTION

PROJ MGR: DPS
DESIGNED BY: DPS
REVIEWED BY: DPS
OPERATOR: CLK
DATE: 11-10-11

GZA GeoEnvironmental, Inc.

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JOB NO. 01.0170143.30

FIGURE NO. 3

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G:\GZA-J:\GZA_USA#\01.0170142.30 Ash Imp. Round 10\01.0170142.30 Task 4 - Nelson Dewey\Drawings\Autocad\SITE PLANS.dwg [FIG 4] November 14, 2011 - 9:57am justin.hegarty

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DATA ACCESSED JULY 2011.

N / W / E / S

150 75 0 150 Feet

NOTE

DISCHARGE PIPELINE DIAMETERS ESTIMATED BY GZA GEOENVIRONMENTAL, INC.

OLD FLY ASH POND/ CLOSED LANDFILL

APPROXIMATE LOCATION OF DECANT STRUCTURE

APPROXIMATE LOCATION OF ARMORED DRAINAGE DITCH

WAVE ACTION EROSION

SG-4

EROSIONAL FEATURE

B-7H

SLAG POND

BG-11

BG-10

WPDES POND

APPROXIMATE LOCATION OF DISCHARGE PIPE FROM WPDES POND

APPROXIMATE LOCATION OF (2)12 INCH DIAMETER DISCHARGE PIPES

TALL SHRUBS PRESENT ON THE SLOPE

B-11A

B-11B

B-11R

WAVE ACTION EROSION

APPROXIMATE LOCATION OF 12 INCH DIAMTER DISCHARGE

B-31A

B-31R

APPROXIMATE LOCATION OF 12 INCH DIAMETER DISCHARGE PIPE

LEGEND

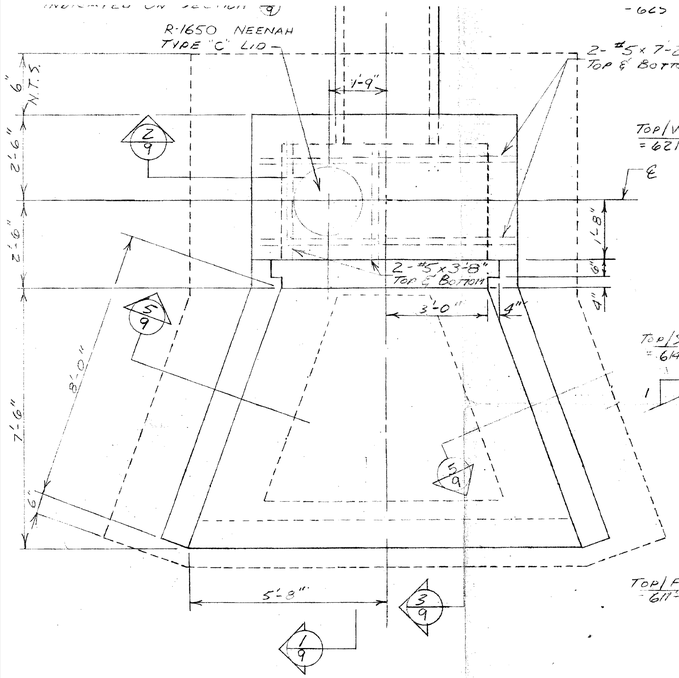
- APPROXIMATE IMPOUNDMENT BOUNDARY
- 12 GZA PHOTO LOCATION / DIRECTION
- B-11A GROUNDWATER MONITORING WELL LOCATIONS
- SG-11 STAFF GAUGE

GZA GeoEnvironmental, Inc.
20900 Swenson Drive, Suite 150
Waukesha, Wisconsin 53186
Phone: (262) 754-2560 Fax: (262) 754-9711

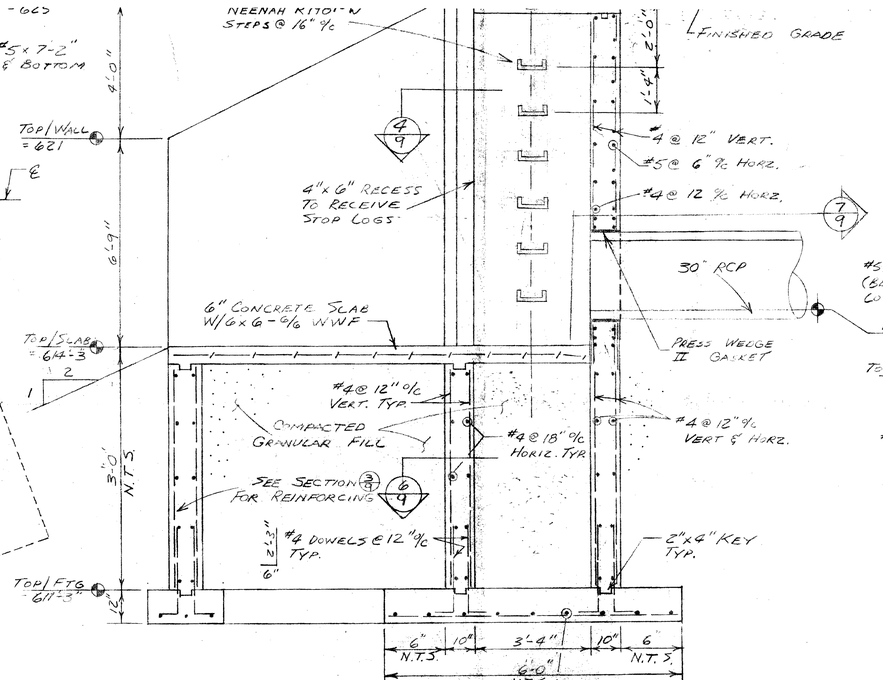
NELSON DEWEY GENERATING STATION
11999 COUNTY ROAD VV
CASSVILLE, WISCONSIN

SLAG POND

PROJ. MGR.: DPS DESIGNED BY: DPS REVIEWED BY: DPS OPERATOR: CLK	DWG. Date: 11-14-11 Job NO.: 01.0170143.30	FIGURE NO.: 4



PLAN VIEW - OUTFALL STRUCTURE
SCALE: 1/2" = 1'-0"



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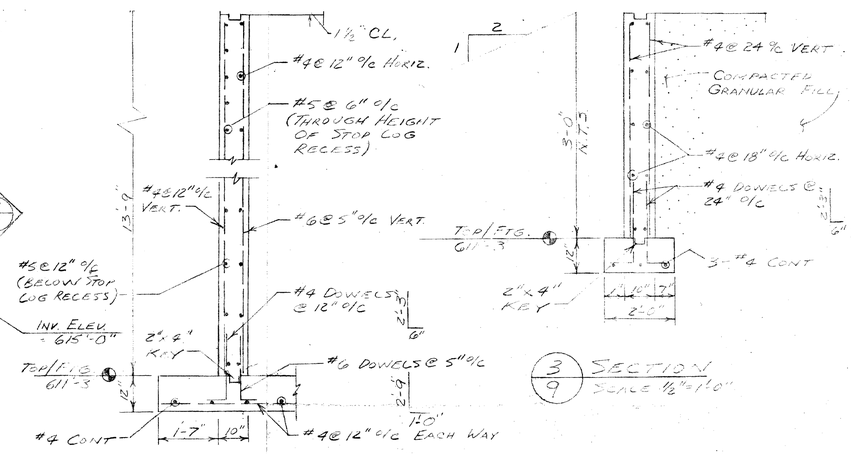

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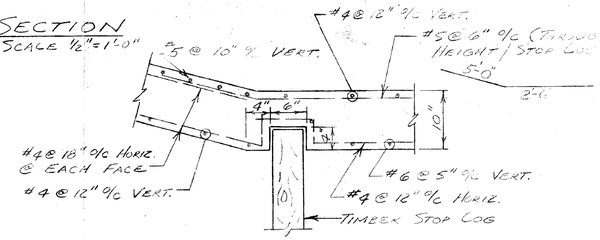
SCALE 1/2"=1'-0"

2/9 SECTION
SCALE 1/2"=1'-0"



4/9 SECTION
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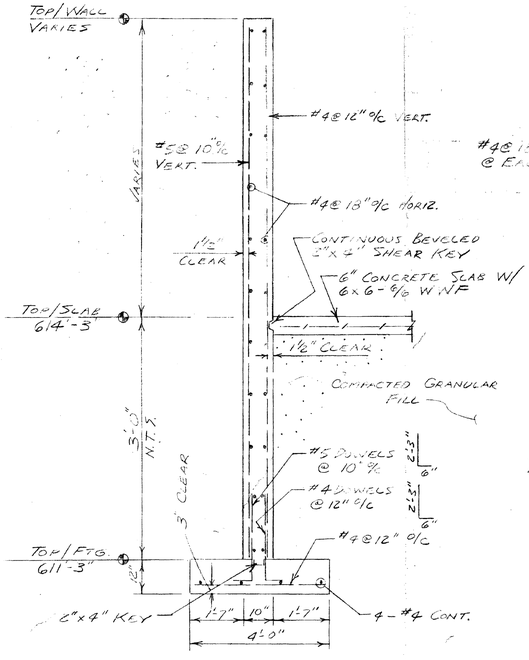

5/9 SECTION
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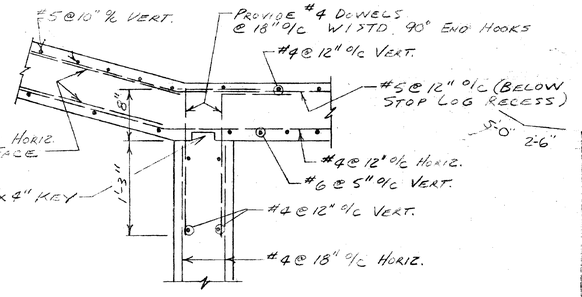

6/9 SECTION
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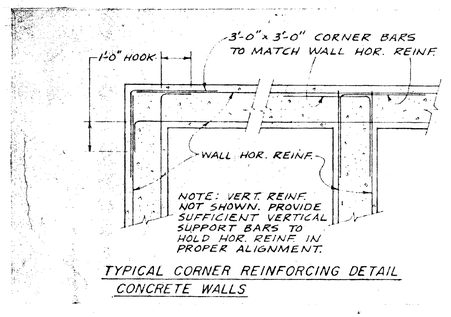
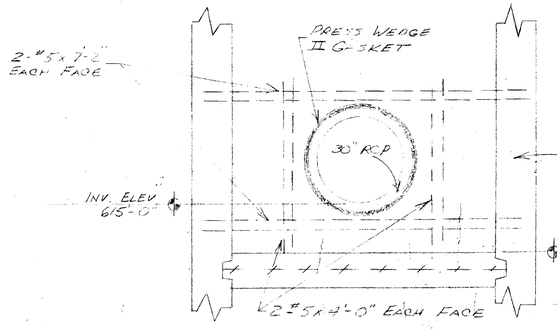


TYPICAL CORNER REINFORCING DETAIL
CONCRETE WALLS



7/9 SECTION
SCALE: NONE

NOTE:
REINFORCING SHOWN IS IN ADDITION TO THAT INDICATED ON SECTION 4/9
SEE SECTION 2/9 FOR WALL REINFORCING TIE.

NOTES

1) MINIMUM CONCRETE COMPRESSIVE STRENGTH @ 28 DAYS = 3000 psi
2) REINFORCING BARS: ASTM A-615 GRADE 60
3) WELDED STEEL WIRE FABRIC: ASTM A-185, 65,000 psi YIELD
4) FILL MATERIAL SHALL BE FREE DRAINING GLASS THIRD 57 PASSING #200 SIEVE) GRANULAR MATERIAL
5) UNDER SLAB FILL SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY, ASTM D1557
6) N.T.S WHERE SHOWN INDICATES DRAWING NOT TO SCALE

NO.	BY	DATE	REVISION	APP'D

OUTFALL STRUCTURAL PLAN & DETAILS

ASH DISPOSAL FACILITY
WISCONSIN POWER AND LIGHT COMPANY
NELSON DEWEY GENERATING STATION
CASSVILLE, WISCONSIN

WARZYN ENGINEERING INC

DRAWN GBH	SCALE AS SHOWN	SHEET 10 OF 10	
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APPROVED RWT		PRINTED MAR 31 1978	
REFERENCE			

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GZA GeoEnvironmental, Inc.
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DESIGNED BY: DPS
REVIEWED BY: DPS
OPERATOR: CLK
DATE: 11-02-11

NELSON DEWEY GENERATING STATION
11999 COUNTY ROAD VV
CASSVILLE, WISCONSIN

OUTFALL PLAN & DETAILS

JOB NO.
01.0170143.30

FIGURE NO.
5

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G:\GZA-J:\GZA_USA#\01.0170142.30 Ash Imp. Round 10\01.0170142.30 Task 4 - Nelson Dewey\Drawings\Autocad\SITE PLANS.dwg [FIG 6] November 14, 2011 - 9:52am justin.hegarty

OLD FLY ASH POND/
CLOSED LANDFILL

PUMP
STATION

SLAG
POND

WPDES
POND

SG-11

SG-10

B-28

APPROXIMATE LOCATION OF
SUCTION LINE

APPROXIMATE LOCATION OF
DISCHARGE CULVERT

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DATA ACCESSED JULY 2011.

N
W E
S

150 75 0 150 Feet

NOTE

DISCHARGE PIPELINE DIAMETERS ESTIMATED BY GZA GEOENVIRONMENTAL, INC.

LEGEND

- APPROXIMATE IMPOUNDMENT BOUNDARY
- 12 GZA PHOTO LOCATION / DIRECTION
- B-28 GROUNDWATER MONITORING WELL LOCATIONS
- SG-11 STAFF GAUGE

GZA GeoEnvironmental, Inc.
20900 Swenson Drive, Suite 150
Waukesha, Wisconsin 53186
Phone: (262) 754-2560 Fax: (262) 754-9711

NELSON DEWEY GENERATING STATION
11999 COUNTY ROAD VV
CASSVILLE, WISCONSIN

WPDES POND

PROJ. MGR.: DPS DESIGNED BY: DPS REVIEWED BY: DPS OPERATOR: CLK	DWG. Date: 11-14-11 Job NO.: 01.0170143.30	FIGURE NO.: 6

US EPA ARCHIVE DOCUMENT

APPENDIX A

LIMITATIONS

US EPA ARCHIVE DOCUMENT

DAM ENGINEERING & VISUAL INSPECTION LIMITATIONS

1. The observations described in this report were made under the conditions stated herein. The conclusions presented in the report were based solely on the services described therein, and not on scientific tasks or procedures beyond the scope of described services.

2. In preparing this report, GZA GeoEnvironmental, Inc. (GZA) has relied on certain information provided by Alliant Energy (and their affiliates) as well as Federal, state, and local officials and other parties referenced therein. GZA has also relied on other parties which were available to GZA at the time of the inspection. Although there may have been some degree of overlap in the information provided by these various sources, GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this work.

3. In reviewing this Report, it should be noted that the reported condition of the dam is based on observations of field conditions during the course of this study along with data made available to GZA. The observations of conditions at the dam reflect only the situation present at the specific moment in time the observations were made, under the specific conditions present. It may be necessary to reevaluate the recommendations of this report when subsequent phases of evaluation or repair and improvement provide more data.

4. It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions may be detected.

5. Water level readings have been reviewed and interpretations have been made in the text of this report. Fluctuations in the level of the groundwater and surface water may occur due to variations in rainfall, temperature, and other factors different than at the time measurements were made.

6. GZA's comments on the hydrology, hydraulics, and embankment stability for the dam are based on a limited review of available design documentation available from Alliant Energy and the Wisconsin Department of Natural Resources. Calculations and computer modeling used in these analyses were not available and were not independently reviewed by GZA.

7. This report has been prepared for the exclusive use of US EPA for specific application to the existing dam facilities, in accordance with generally accepted dam engineering practices. No other warranty, express or implied, is made.

8. This dam inspection verification report has been prepared for this project by GZA. This report is for broad evaluation and management purposes only and is not sufficient, in and of itself, to prepare construction documents or an accurate bid.

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APPENDIX B

DEFINITIONS

US EPA ARCHIVE DOCUMENT

COMMON DAM SAFETY DEFINITIONS

For a comprehensive list of dam engineering terminology and definitions refer to references published by the U.S. Army Corps of Engineers, the Federal Energy Regulatory Commission, the Department of the Interior Bureau of Reclamation, or the Federal Emergency Management Agency.

Orientation

Upstream – Shall mean the side of the dam that borders the impoundment.

Downstream – Shall mean the high side of the dam, the side opposite the upstream side.

Right – Shall mean the area to the right when looking in the downstream direction.

Left – Shall mean the area to the left when looking in the downstream direction.

Dam Components

Dam – Shall mean any artificial barrier, including appurtenant works, which impounds or diverts water.

Embankment – Shall mean the fill material, usually earth or rock, placed with sloping sides, such that it forms a permanent barrier that impounds water.

Crest – Shall mean the top of the dam, usually provides a road or path across the dam.

Abutment – Shall mean that part of a valley side against which a dam is constructed. An artificial abutment is sometimes constructed as a concrete gravity section, to take the thrust of an arch dam where there is no suitable natural abutment.

Appurtenant Works – Shall mean structures, either in dams or separate there from, including but not be limited to, spillways; reservoirs and their rims; low level outlet works; and water conduits including tunnels, pipelines, or penstocks, either through the dams or their abutments.

Spillway – Shall mean a structure over or through which water flows are discharged. If the flow is controlled by gates or boards, it is a controlled spillway; if the fixed elevation of the spillway crest controls the level of the impoundment, it is an uncontrolled spillway.

General

EAP – Emergency Action Plan - Shall mean a predetermined plan of action to be taken to reduce the potential for property damage and/or loss of life in an area affected by an impending dam break.

O&M Manual – Operations and Maintenance Manual; Document identifying routine maintenance and operational procedures under normal and storm conditions.

Normal Pool – Shall mean the elevation of the impoundment during normal operating conditions.

Acre-foot – Shall mean a unit of volumetric measure that would cover one acre to a depth of one foot. It is equal to 43,560 cubic feet. One million U.S. gallons = 3.068 acre feet.

Height of Dam – Shall mean the vertical distance from the lowest portion of the natural ground, including any stream channel, along the downstream toe of the dam to the crest of the dam.

Spillway Design Flood (SDF) – Shall mean the flood used in the design of a dam and its appurtenant works particularly for sizing the spillway and outlet works, and for determining maximum temporary storage and height of dam requirements.

Condition Rating

SATISFACTORY - No existing or potential management unit safety deficiencies are recognized. Acceptable performance is expected under all applicable loading conditions (static, hydrologic, seismic) in accordance with the applicable criteria. Minor maintenance items may be required.

FAIR - Acceptable performance is expected under all required loading conditions (static, hydrologic, seismic) in accordance with the applicable safety regulatory criteria. Minor deficiencies may exist that require remedial action and/or secondary studies or investigations.

POOR - A management unit safety deficiency is recognized for any required loading condition (static, hydrologic, seismic) in accordance with the applicable dam safety regulatory criteria. Remedial action is necessary. POOR also applies when further critical studies or investigations are needed to identify any potential dam safety deficiencies.

UNSATISFACTORY - Considered unsafe. A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution. Reservoir restrictions may be necessary.

Hazard Potential

(In the event the impoundment should fail, the following would occur):

LESS THAN LOW HAZARD POTENTIAL: Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

LOW HAZARD POTENTIAL: Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

SIGNIFICANT HAZARD POTENTIAL: Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

HIGH HAZARD POTENTIAL: Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

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US EPA ARCHIVE DOCUMENT

APPENDIX C

INSPECTION CHECKLISTS

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name:	Nelson Dewey Generating Station	Date:	6/7/11
Unit Name:	Slag Pond	Operator's Name:	Alliant Energy
Unit I.D.:		Hazard Potential Classification:	High Significant Low ✓

Inspector's Name: Patrick J. Harrison, P.E. and Doug P. Simon, P.E.

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Quarterly		18. Sloughing or bulging on slopes?		✓
2. Pool elevation (operator records)?	616.6		19. Major erosion or slope deterioration?		✓
3. Decant inlet elevation (operator records)?	NA		20. Decant Pipes: See Note Below		
4. Open channel spillway elevation (operator records)?	615.3		Is water entering inlet, but not exiting outlet?		
5. Lowest dam crest elevation (operator records)?	625.0		Is water exiting outlet, but not entering inlet?		
6. If instrumentation is present, are readings recorded (operator records)?	✓		Is water exiting outlet flowing clear?		
7. Is the embankment currently under construction?		✓	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)?			From underdrain?	NA	
9. Trees growing on embankment? (If so, indicate largest diameter below)	✓		At isolated points on embankment slopes?		✓
10. Cracks or scarps on crest?		✓	At natural hillside in the embankment area?		✓
11. Is there significant settlement along the crest?		✓	Over widespread areas?		✓
12. Are decant trashracks clear and in place?	NA		From downstream foundation area?		✓
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		✓	"Boils" beneath stream or ponded water?		✓
14. Clogged spillways, grown or diversion ditches?		✓	Around the outside of the decant pipe?		✓
15. Are spillway or ditch linings deteriorated?		✓	22. Surface movements in valley bottom or on hillside?		✓
16. Are outlets of decant or underdrains blocked?			23. Water against downstream toe?		✓
17. Cracks or scarps on slopes?		✓	24. Were Photos taken during the dam inspection?	✓	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue # Comments

8. No information was available about foundation preparation.

9. Up to 1-inch diameter. Growth since cutting last year.

U. S. Environmental Protection Agency

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # WI-0002381-06-0 INSPECTOR Patrick J. Harrison, P.E.
Doug P. Simon, P.E.

Date June 7, 2011

Impoundment Name Slag Pond
Impoundment Company Alliant Energy
EPA Region Region V
State Agency (Field Office) Addresss Wisconsin Department of Natural Resources
Madison, Wisconsin
Name of Impoundment Slag Pond
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update _____

	Yes	No
Is impoundment currently under construction?	_____	X
Is water or ccw currently being pumped into the impoundment?	X	_____

IMPOUNDMENT FUNCTION: Settlement of slag.

Nearest Downstream Town : Name Cassville, Wisconsin
Distance from the impoundment 0.8-mile
Impoundment Location: Longitude 91 Degrees 00 Minutes 49 Seconds
Latitude 42 Degrees 43 Minutes 32 Seconds
State WI County Grant

Does a state agency regulate this impoundment? YES X NO _____

If So Which State Agency? Wisconsin Department of Natural Resources regulates discharges under WPDES Permit.

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

_____ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

__x__ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

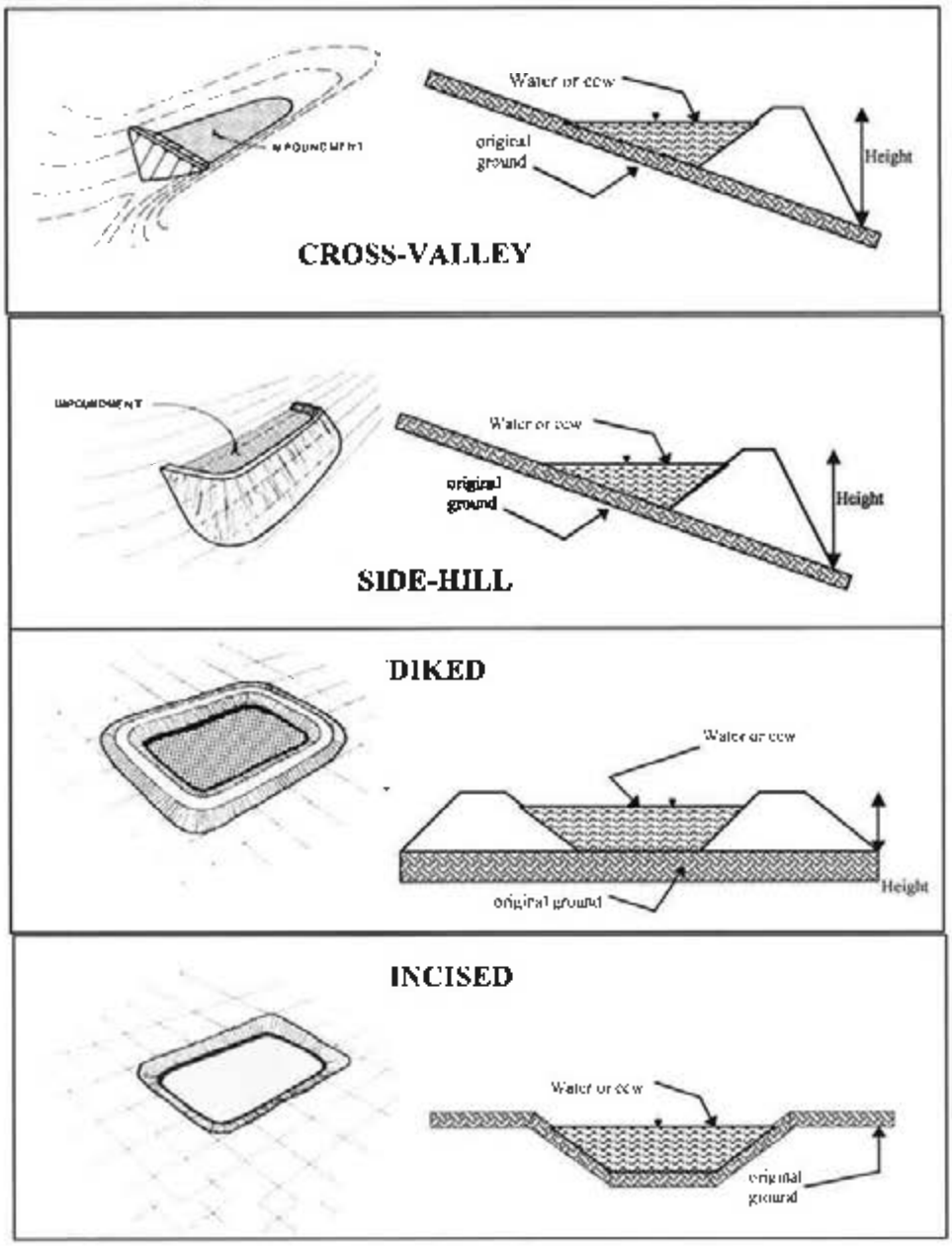
_____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

_____ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

No probable loss of life and losses would be principally limited to owner's property.

CONFIGURATION:

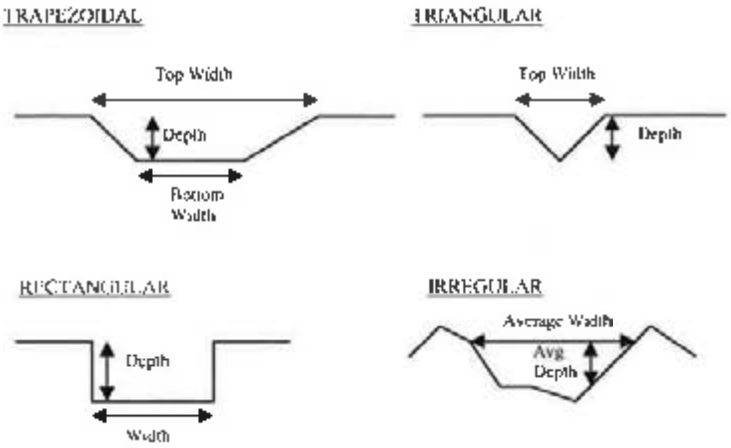


_____ Cross-Valley
_____ Side-Hill
_____ Diked
_____ Incised (form completion optional)
__X__ Combination Incised/Diked

Embankment Height __10__ feet
Pool Area __4.65__ acres
Current Freeboard __8__ feet
Embankment Material __Sand__
Liner __Not Present__
Liner Permeability __N/A__

TYPE OF OUTLET (Mark all that apply)

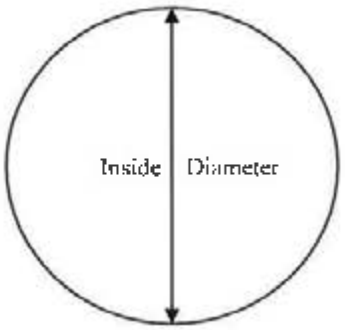
_____ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular



_____ depth
_____ bottom (or average) width
_____ top width

_____

__X__ **Outlet**



__30"__ inside diameter
Varies: See Below.

Material
_____ corrugated metal
_____ welded steel
__X__ concrete
_____ plastic (hdpe, pvc, etc.)
_____ other (specify) _____

_____

Is water flowing through the outlet? YES _____ NO _____

The outlet structure was not accessible due to heavy vegetation.

_____ **No Outlet**

_____

_____ **Other Type of Outlet** (specify) _____

The Impoundment was Designed By Warzyn Engineering Inc.

_____

Has there ever been a failure at this site? YES _____ NO __X_____

If So When? _____

If So Please Describe : _____

Has there ever been significant seepages at this site? YES _____ NO __X__

If So When? _____

IF So Please Describe: _____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES _____ NO N/A

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name:	Nelson Dewey Generating Station	Date:	6/7/11
Unit Name:	WPDES Pond	Operator's Name:	Alliant Energy
Unit I.D.:		Hazard Potential Classification:	High Significant Low ✓

Inspector's Name: Patrick J. Harrison, P.E. and Doug P. Simon, P.E.

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Quarterly		18. Sloughing or bulging on slopes?		✓
2. Pool elevation (operator records)?	618.0		19. Major erosion or slope deterioration?		✓
3. Decant inlet elevation (operator records)?	NA		20. Decant Pipes: See Note Below		
4. Open channel spillway elevation (operator records)?	NA		Is water entering inlet, but not exiting outlet?		
5. Lowest dam crest elevation (operator records)?	620.0		Is water exiting outlet, but not entering inlet?		
6. If instrumentation is present, are readings recorded (operator records)?	✓		Is water exiting outlet flowing clear?		
7. Is the embankment currently under construction?		✓	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)?			From underdrain?		✓
9. Trees growing on embankment? (If so, indicate largest diameter below)	✓		At isolated points on embankment slopes?		✓
10. Cracks or scarps on crest?		✓	At natural hillside in the embankment area?		✓
11. Is there significant settlement along the crest?		✓	Over widespread areas?		✓
12. Are decant trashracks clear and in place?	NA		From downstream foundation area?		✓
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		✓	"Boils" beneath stream or ponded water?		✓
14. Clogged spillways, groin or diversion ditches?		✓	Around the outside of the decant pipe?		✓
15. Are spillway or ditch linings deteriorated?		✓	22. Surface movements in valley bottom or on hillside?		✓
16. Are outlets of decant or underdrains blocked?	NA		23. Water against downstream toe?		✓
17. Cracks or scarps on slopes?		✓	24. Were Photos taken during the dam inspection?	✓	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue # Comments

8. No information was available about foundation preparation.

9. Trees up.

20. Water is pumped out of pond for dust control.

U. S. Environmental Protection Agency

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # WI-0002381-06-0

INSPECTOR Patrick J. Harrison, P.E.
Doug P. Simon, P.E.

Date June 7, 2011

Impoundment Name WPDES Pond
Impoundment Company Alliant Energy
EPA Region Region V
State Agency (Field Office) Addresss Wisconsin Department of Natural Resources
Madison, Wisconsin
Name of Impoundment WPDES Pond
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update _____

	Yes	No
Is impoundment currently under construction?	_____	X
Is water or ccw currently being pumped into the impoundment?	_____	X

IMPOUNDMENT FUNCTION: Collection of coal pile runoff, plant grounds non-chemical boiler wash water. Most water recycled for watering.

Nearest Downstream Town : Name Cassville, Wisconsin
Distance from the impoundment 0.8-mile
Impoundment Location: Longitude 91 Degrees 00 Minutes 32 Seconds
Latitude 42 Degrees 43 Minutes 32 Seconds
State WI County Grant

Does a state agency regulate this impoundment? YES X NO _____

If So Which State Agency? Wisconsin Department of Natural Resources regulates discharges under WPDES Permit.

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

_____ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

__X__ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

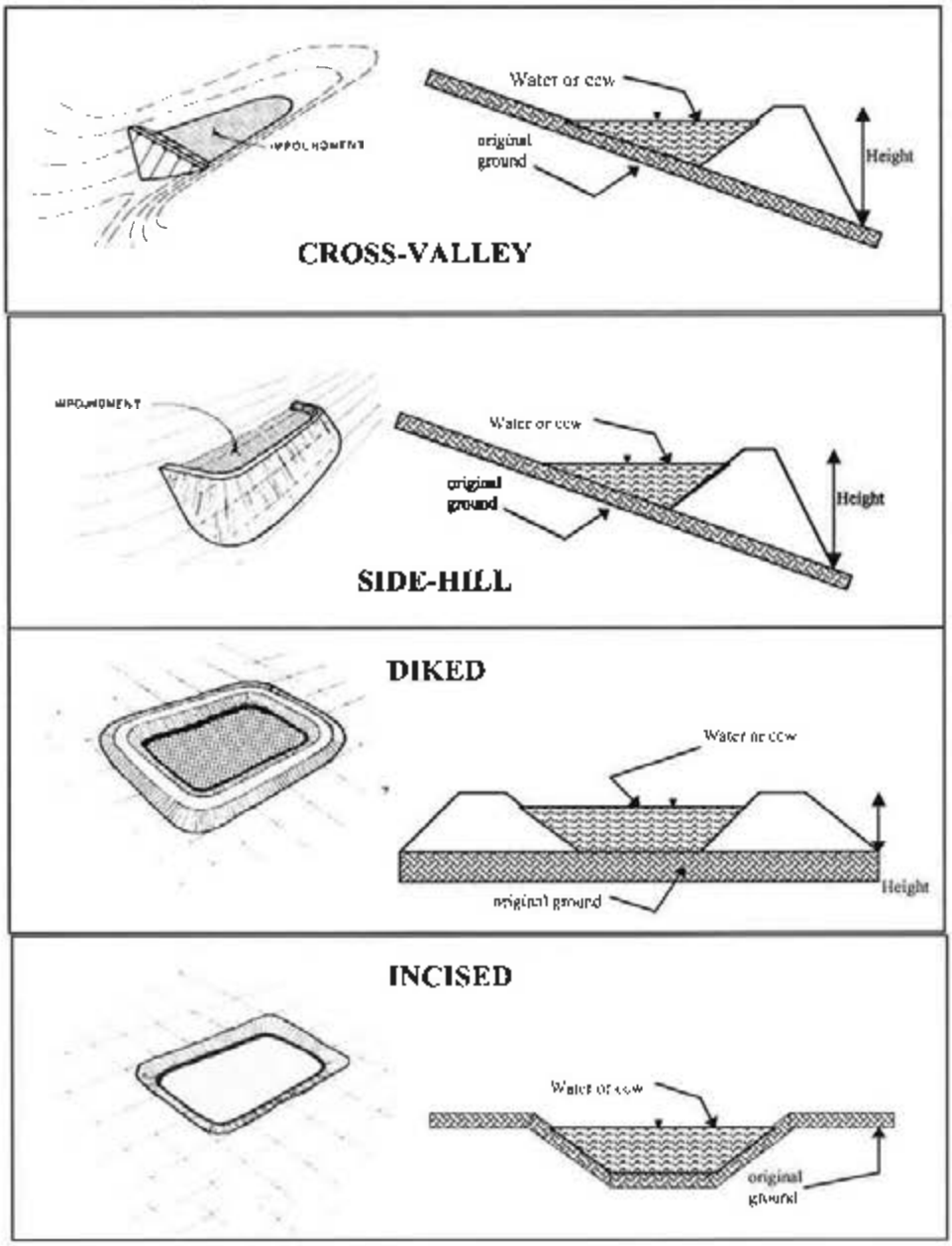
_____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

_____ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

Failure would not likely result in loss of life and low environmental loss. Losses would be principally limited to owner's property.

CONFIGURATION:

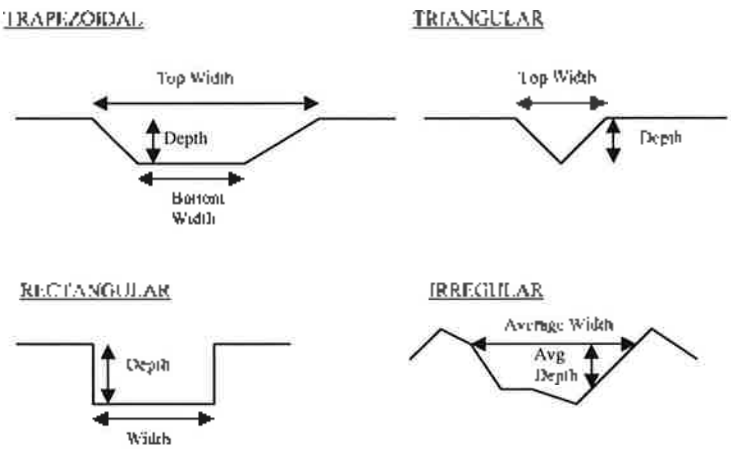


_____ Cross-Valley
_____ Side-Hill
_____ Diked
_____ Incised (form completion optional)
__X__ Combination Incised/Diked

Embankment Height 10 feet
Pool Area 4.35 acres
Current Freeboard 2 feet
Embankment Material Sand
Liner Not Present
Liner Permeability N/A

TYPE OF OUTLET (Mark all that apply)

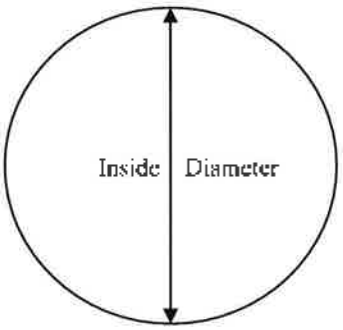
_____ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular



_____ depth
_____ bottom (or average) width
_____ top width
_____

_____ **Outlet**

_____ inside diameter
Varies: See Below.



Material
_____ corrugated metal
_____ welded steel
_____ concrete
_____ plastic (hdpe, pvc, etc.)
_____ other (specify) _____

_____

Is water flowing through the outlet? YES _____ NO _____

The outlet structure was not accessible due to heavy vegetation.

_____ **No Outlet**

_____

__X__ **Other Type of Outlet** (specify) Water is pumped from pond.

The Impoundment was Designed By Warzyn Engineering Inc.

Has there ever been a failure at this site? YES _____ NO __X_____

If So When? _____

If So Please Describe : _____

Has there ever been significant seepages at this site? YES _____ NO __X__

If So When? _____

IF So Please Describe: _____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES _____ NO N/A

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____

US EPA ARCHIVE DOCUMENT

APPENDIX D

REFRENCES

REFERENCE LIST
NELSON DEWEY GENERATING STATION

Warzyn Engineering, Inc. TITLE OF THE DRAWING COULD NOT BE DISTINGUISHED. Drawing C6299-15 Dated October 1, 1976.

Warzyn Engineering, Inc. Ash Disposal Facility Wisconsin Power and Light Company Nelson Dewey Generating Station Cassville, Wisconsin. Drawing C6299-37 Dated March 29, 1978.

BT^2 Inc. "Slag Pond Survey and Hydraulic Evaluation, Alliant Energy Nelson Dewey Energy Center BT^2 Project #3197." Dated September 5, 2006.

BT^2 Inc. "Management Plan and Proposed Modifications for Seepage Ponds (Outfall 005) Aliant Energy – Nelson Dewey Energy Center WPDES Permit No. WI 0002381-4." Dated June 21, 1999.

RMT. "Wisconsin Power and Light Company, Nelson Dewey Generating Station Bienniel Groundwater Monitoring Report, Figure 2." Dated January 2010.

Sievers, Nate. Alliant Energy Surface Pond Visual Inspection. Dated September 16, 2011.

Miller Engineers Scientists. "Cross Sections; Edgewater Generating Station; Impoundment Analysis." Dated March 15, 2011. Sheet 3 of 3.

Aether dbs. " Ash Pond Slope Stability and Hydraulic Analysis, Nelson Dewey Generating Station Wisconsin Power and Light Company Cassville, Wisconsin." Dated June 27, 2011.

US EPA ARCHIVE DOCUMENT

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APPENDIX E

PREVIOUS INSPECTION REPORTS

CONFIDENTIAL BUSINESS INFORMATION

ALLIANT ENERGY SURFACE POND VISUAL INSPECTION

PLANT NAME:	DATE COMPLETED	LIST POND INSPECTED:
Nelson Dewey	16-Sep-11	Slag Pond
INSPECTOR(S) List Below: Nate Sievers	WEATHER CONDITIONS Describe Weather Conditions: Cloudy 51F, Winds 4 mph ESE. Dry Conditions	
PLANT MANAGEMENT REVIEW(if applicable). Spell Name: Plant Manager Wamsley; E&S Specialist Nate Sievers	SIGNATORY REVIEW:	

	Yes	No	Action Needed?
1. Dike Integrity			
Visual Signs of Animal Activity into the dike wall that may impact the integrity of the dike wall?		X	
Trees growing on top or side of dike in which the root system may impact the integrity of the dike wall?		X	
Woody type shrubs growing on top or side of dike in which the root system may impact the integrity of the dike wall?	X		X
Any visual seeps of water through the dike wall?		X	
Any areas of soft soil-dead vegetation on the dike wall?		X	
Any areas of erosion caused either by wind erosion, storm water runoff into or outside the dike wall?		X	
Any evidence of ash pond water washing over the dike wall?		X	
Where applicable, are any of the valving or piping used to control the discharge from a pond leaking?		X	
Any ponding of water outside the dike wall?		X	
Any evidence of damage caused by heavy equipment?		X	
2. Outfall Structure			
Any areas of erosion or animal activity near or at the entrance of the outfall structure or pipe that may cause wastewater to travel along the outside of the pipe?		X	
Any areas of erosion, animal activity, swirling of wastewater on the discharge side of the outfall structure that may impact the integrity of the dike or structure?		X	
Woody type shrubs growing on top or side of dike in which the root system may impact the integrity of the dike wall?		X	
3. Visable Solids			
Is there a build up of settled ash visible near the dike walls or discharge structure?		X	

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CONFIDENTIAL BUSINESS INFORMATION

ALLIANT ENERGY SURFACE POND VISUAL INSPECTION

PLANT NAME:	DATE COMPLETED	LIST POND INSPECTED
Nelson Dewey	16-Sep-11	WPDES
INSPECTOR(S). List Below	WEATHER CONDITIONS. Describe Weather Conditions	
Nate Sievers	Cloudy 51F. Winds 4 mph ESE, Dry Conditions	
PLANT MANAGEMENT REVIEW(if applicable) Spell Name Plant Manager Jim Warnsley E&S Specialist Nate Sievers	SIGNATORY REVIEW	

1. Dike Integrity	Yes	No	Action Needed?
Visual Signs of Animal Activity into the dike wall that may impact the integrity of the dike wall?		X	
Trees growing on top or side of dike in which the root system may impact the integrity of the dike wall?		X	
Woody type shrubs growing on top or side of dike in which the root system may impact the integrity of the dike wall?		X	
Any visual seeps of water through the dike wall?		X	
Any areas of soft soil/dead vegetation on the dike wall?		X	
Any areas of erosion caused either by wind erosion, storm water runoff into or outside the dike wall?		X	
Any evidence of ash pond water washing over the dike wall?		X	
Where applicable, are any of the valving or piping used to control the discharge from a pond leaking?		X	
Any ponding of water outside the dike wall?		X	
Any evidence of damage caused by heavy equipment?		X	
2. Outfall Structure			
Any areas of erosion or animal activity near or at the entrance of the outfall structure or pipe that may cause wastewater to travel along the outside of the pipe?		X	
Any areas of erosion; animal activity; swirling of wastewater on the discharge side of the outfall structure that may impact the integrity of the dike or structure?		X	
Woody type shrubs growing on top or side of dike in which the root system may impact the integrity of the dike wall?		X	
3. Visable Solids			
Is there a build up of settled ash visible near the dike walls or discharge structure?		X	

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CONFIDENTIAL BUSINESS INFORMATION

ALLIANT ENERGY SURFACE POND VISUAL INSPECTION

PLANT NAME:	DATE COMPLETED:	LIST POND INSPECTED
Nelson Dewey	16-Sep-11	Coal Runnoff
INSPECTOR(S): List Below	WEATHER CONDITIONS: Describe Weather Conditions	
Nate Sievers	Cloudy 51F, Winds 4 mph ESE, Dry Conditions	
PLANT MANAGEMENT REVIEW(if applicable) Spelt Name Plant Manager Jon Wanless E&S Specialist Nate Sievers	SIGNATORY REVIEW:	

	Yes	No	Action Needed?
1. Dike Integrity			
Visual Signs of Animal Activity into the dike wall that may impact the integrity of the dike wall?		X	
Trees growing on top or side of dike in which the root system may impact the integrity of the dike wall?		X	
Woody type shrubs growing on top or side of dike in which the root system may impact the integrity of the dike wall?		X	
Any visual seeps of water through the dike wall?		X	
Any areas of soft soil/dead vegetation on the dike wall?		X	
Any areas of erosion caused either by wind erosion, storm water runoff into or outside the dike wall?		X	
Any evidence of ash pond water washing over the dike wall?		X	
Where applicable, are any of the valving or piping used to control the discharge from a pond leaking?		X	
Any ponding of water outside the dike wall?		X	
Any evidence of damage caused by heavy equipment?		X	
2. Outfall Structure			
Any areas of erosion or animal activity near or at the entrance of the outfall structure or pipe that may cause wastewater to travel along the outside of the pipe?		X	
Any areas of erosion; animal activity ; swirling of wastewater on the discharge side of the outfall structure that may impact the integrity of the dike or structure?		X	
Woody type shrubs growing on top or side of dike in which the root system may impact the integrity of the dike wall?		X	
3. Visable Solids			
Is there a build up of settled ash visible near the dike walls or discharge structure?		X	

NOTES or OBSERVATIONS

Provide a description of the issue or observation below:

ISSUE	Description and Location of Issue	Maximo Work Order #	Due Date	Date Completed
5	Slag pond has areas of Sumac around the need	7203678	12/31/2011	
6	Slag pond also has erosion around pipe of 002.		12/31/2011	
7	All woody species around pond need to be	7203678	12/31/2011	

Review this Sheet Prior to each Inspection

US EPA ARCHIVE DOCUMENT

CONFIDENTIAL BUSINESS INFORMATION

ALLIANT ENERGY SURFACE POND PHOTO LOG

Figure 1 Trees needed to be removed on slag pond.

Figure 2 Need to finish cutting sumac.

US EPA ARCHIVE DOCUMENT

INSPECTION FORM INSTRUCTIONS		
1)	**Plant Name**	Insert name of facility being inspected
2)	**Date**	List date of when inspection was completed
3)	**List Pond Inspected**	List plant name of pond being inspected. For plants with multiple ponds, use one inspection form per pond Example: Coal Pile Runoff Pond
4)	**Inspectors**	List name of employee(s) who performed the inspection
5)	**Weather Conditions**	List the current weather conditions (cloud cover/precip/temp/wind strength) If there was a substantial rain or runoff event, please note as well
6)	**Plant Mgmt Review**	Plant Manager and Environmental and Safety Specialist will review the report with the inspector(s)
7)	**Signatory Review**	Plant Manager and Environmental and Safety Specialist are required to review and sign off on the inspection form
8)	**Inspection Process**	Inspect each side of the pond looking for conditions in the checklist Answer each question and note any issues on page 2 If any issue is discovered, please note the location of the area in question and the steps taken to resolve the issue

US EPA ARCHIVE DOCUMENT

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APPENDIX F

PHOTOGRAPHS

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No.	Date:
1	6/7/11

Direction Photo Taken:
Northwest

Description:
Upstream slope of the Slag Pond.

Photo No.	Date:
2	6/7/11

Direction Photo Taken:
South

Description:
Upstream slope of the Slag Pond.

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No.	Date:
3	6/7/11

Direction Photo Taken:
Northwest

Description:
Upstream slope of the Slag Pond.

Photo No.	Date:
4	6/7/11

Direction Photo Taken:
Northwest

Description:
Upstream slope of the Slag Pond.

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No.	Date:
5	6/7/11

Direction Photo Taken:
Southwest

Description:
Upstream slope of the Slag Pond.

Photo No.	Date:
6	6/7/11

Direction Photo Taken:
Southeast

Description:
Upstream slope and crest of the Slag Pond.

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No.	Date:
7	6/7/11

Direction Photo Taken:
Southeast

Description:
Upstream slope and crest of the Slag Pond.

Photo No.	Date:
8	6/7/11

Direction Photo Taken:
East

Description:
Upstream slope and crest of the Slag Pond.

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No.	Date:
9	6/7/11

Direction Photo Taken:
Northeast

Description:
Crest of the Slag Pond.

Photo No.	Date:
10	6/7/11

Direction Photo Taken:
Northwest

Description:
Crest of the Slag Pond.

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No.	Date:
11	6/7/11

Direction Photo Taken:
North

Description:
Animal burrow on the crest of the Slag Pond.

Photo No.	Date:
12	6/7/11

Direction Photo Taken:
Southwest

Description:
Crest of the Slag Pond.

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No.	Date:
13	6/7/11

Direction Photo Taken:
Northwest

Description:
Crest of the Slag Pond.

Photo No.	Date:
14	6/7/11

Direction Photo Taken:
Southeast

Description:
Crest of the Slag Pond.

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No.	Date:
15	6/7/11

Direction Photo Taken:
Northwest

Description:
Discharge pipe near the southeast corner of the Slag Pond.

Photo No.	Date:
16	6/7/11

Direction Photo Taken:
Southwest

Description:
Discharge pipes along the eastern embankment of the Slag Pond as seen from the north.

US EPA ARCHIVE DOCUMENT

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No.	Date:
17	6/7/11

Direction Photo Taken:
Northeast

Description:
Armored portion of the northern embankment of the Slag Pond. Armoring present to protect against erosion from storm water runoff.

Photo No.	Date:
18	6/7/11

Direction Photo Taken:
Southwest

Description:
Armored portion of the northern embankment of the Slag Pond. Armoring present to protect against erosion from storm water runoff.

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No. 19	Date: 6/7/11

Direction Photo Taken:
West

Description:
Decant structure and weir in the Slag Pond.

Photo No. 20	Date: 6/7/11

Direction Photo Taken:
West

Description:
Staff Gauge at the decant structure in the Slag Pond.

US EPA ARCHIVE DOCUMENT

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No.	Date:
21	6/7/11

Direction Photo Taken:
Southwest

Description:
Discharge pipe from the Slag Pond.

Photo No.	Date:
22	6/7/11

Direction Photo Taken:
Southeast

Description:
Erosional feature near the crest of the Slag Pond.

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No. 23	Date: 6/7/11

Direction Photo Taken:
Northeast

Description:
Discharge pipes into the Slag Pond.

Photo No. 24	Date: 6/7/11

Direction Photo Taken:
Southeast

Description:
Eight inch diameter discharge pipe from the WPDES Pond into the Slag Pond.

US EPA ARCHIVE DOCUMENT

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No. 25	Date: 6/7/11

Direction Photo Taken:
North

Description:
Downstream slope of the Slag Pond.

Photo No. 26	Date: 6/7/11

Direction Photo Taken:
Southeast

Description:
Upstream slope and crest of the WPDES Pond.

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No.	Date:
27	6/7/11

Direction Photo Taken:
Southeast

Description:
Upstream slope and crest of the WPDES Pond.

Photo No.	Date:
28	6/7/11

Direction Photo Taken:
Southeast

Description:
CMP culvert that discharges near the southeast corner of the WPDES Pond.

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No. 29	Date: 6/7/11

Direction Photo Taken:
East

Description:
Upstream slope of the WPDES Pond.

Photo No. 30	Date: 6/7/11

Direction Photo Taken:
North

Description:
Upstream slope and crest of the WPDES Pond.

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No.	Date:
31	6/7/11

Direction Photo Taken:
Northwest

Description:
Upstream slope and crest of the WPDES Pond.

Photo No.	Date:
32	6/7/11

Direction Photo Taken:
Northwest

Description:
Upstream slope and crest of the WPDES Pond.

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No.	Date:
33	6/7/11

Direction Photo Taken:
Southwest

Description:
Upstream slope and crest of the WPDES Pond.

Photo No.	Date:
34	6/7/11

Direction Photo Taken:
Southeast

Description:
Intermediate embankment in the WPDES Pond.

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No. 35	Date: 6/7/11

Direction Photo Taken:
Northwest

Description:
Upstream slope and crest of the WPDES Pond.

Photo No. 36	Date: 6/7/11

Direction Photo Taken:
Southwest

Description:
Crest of the WPDES Pond.

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No.	Date:
37	6/7/11

Direction Photo Taken:
Southeast

Description:
Crest of the WPDES Pond.

Photo No.	Date:
38	6/7/11

Direction Photo Taken:
Southeast

Description:
Crest of the WPDES Pond.

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No. 39	Date: 6/7/11

Direction Photo Taken:
North

Description:
Crest and downstream slope of the WPDES Pond.

Photo No. 40	Date: 6/7/11

Direction Photo Taken:
Northwest

Description:
Downstream slope and crest of the WPDES Pond.

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No. 41	Date: 6/7/11

Direction Photo Taken:
East

Description:
Pump house at the WPDES Pond.

Photo No. 42	Date: 6/7/11

Direction Photo Taken:
Southwest

Description:
Temporary stormwater discharge pipes along the WPDES Pond.

US EPA ARCHIVE DOCUMENT

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No.	Date:
43	6/7/11

Direction Photo Taken:
Southeast

Description:
Water suction pipe used to collect water for dust control.

Photo No.	Date:
44	6/7/11

Direction Photo Taken:
Southeast

Description:
CMP discharge pipe into the WPDES Pond.

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No.	Date:
45	6/7/11

Direction Photo Taken:
North

Description:
Closed landfill portion of the Site.

Photo No.	Date:
46	6/7/11

Direction Photo Taken:
Northeast

Description:
Closed landfill portion of the Site.

US EPA ARCHIVE DOCUMENT

US EPA ARCHIVE DOCUMENT

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Nelson Dewey Generating Station Cassville, Wisconsin	Project No. 01.0170142.30

Photo No. 47	Date: 6/7/11

Direction Photo Taken:
Northwest

Description:
Closed landfill portion of the Site.

Photo No. 48	Date: 6/7/11

Direction Photo Taken:
Southeast

Description:
Closed landfill portion of the Site.